Will Home Computers Transform Schools?

Teachers and software makers say yes, but problems of equity and quality of courseware remain unresolved

As computers and related technology come to play a dominant role in elementary and secondary schools, the nature of instruction is going to depend to a large extent on students' access to educational technology at home, according to participants at a recent conference sponsored by the National Institute of Education.

Yet at present there is little coordination between schools and families, most educational software is unimpressive, and there are no solutions in sight for the disparity between students who have home computers and those who do not.

Attempts to assess the picture are difficult because it is changing so rapidly and there is very little research available. Commerce in home computer technology offers an example of free enterprise at its most untrammeled. It involves a radical new technology; a vast, mostly untapped market, and abundant opportunities for hucksterism. As Ernest Anastasio of the Educational Testing Service in Princeton, New Jersey, observed, "this movement is all being driven by business interests other than education."

Some conference participants believe that ultimately, basic education will involve the integration of home and school instruction. But currently, the two markets have virtually nothing to do with each other. School courseware has to be designed in 10 or 20-minute modules to correspond with the amount of time most students get to spend weekly on a computer. It should fit into the curriculum, and avoid socially undesirable content. It should be designed by professionals and evaluated in the field. Buyers want bulk discounts and proof of efficacy.

It is hardly surprising, then, that courseware publishers are aiming most products at the home market. As one observed, "There are 80 million households out there, versus 150,000 school buildings." All that concerns home buyers, she said, is packaging and cost. Quality accounts for about "5 percent" of the appeal.

According to participants—who included educators, parents, and purveyors of software—only 9 percent of last year's $1.1 billion in home software sales was spent on educational material. About half of this is for "edutainment"—computer games with plenty of "bells and whistles" that claim varying degrees of educational value. The rest of the 9 percent goes for instructional programs, primarily in math, and computer literacy.

According to Joseph Giacquinta of New York University, a survey of students using computers at home revealed that "programming is the dominant educational activity," followed at a distance by word processing. "Serious educational material," he said, is largely ignored. Typing programs and programs to prepare for SAT exams are big sellers, but instructional fare generally has no appeal unless presented (like "Math Blaster") in arcade game formats.

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In addition to the uneven quality and limited range of educational software, another pervasive problem concerns equity. Not only will rich and poor school systems have unequal access to new technologies, but, probably more important, there will be a learning gap between students who have home computers and those who do not. The vast majority of home computer buyers are well off, well educated and white. Sixty percent of those purchasing computers costing over $500 have incomes over $40,000. Although home computers are mainly used for games, many believe the day will come when they are routinely used for homework, independent learning, and development of computer proficiency.

There is also a radical imbalance in computer use between the sexes. Ninety-three percent of home users are males. Boys way outnumber girls anywhere there is discretionary use such as arcades, computing centers, and computer camps. A high proportion of female users are mainly interested in word processors. Computer games, educational and otherwise, tend to be oriented to male tastes for violence and destruction.

Computers, at their present cost, as one participant remarked, "are not now a democratic medium." They could conceivably turn society into one of "technocrats and technopeasants" unless equity problems in both hardware and software are resolved.

Participants nonetheless predicted that the integration of home and school use of technology will profoundly affect basic education. People did not think a large-scale move to home learning as a substitute for school attendance was likely—despite widespread parental disillusionment with schools. Rather, they thought home instruction would be used as a supplement to school, with home the place for more open-ended, creative and time consuming exercises not requiring supervision. Peter Dirr of the Corporation for Public Broadcasting predicted that pressures will mount to find ways to integrate home and school learning experiences, as is done with some television programs. Sherwin Steffin of Edu-Ware in Agoura Hills, California, suggested that use of the technology could bring about a new "school-parent partnership" where use of the same courseware at home and school could enable parents to participate in instructional strategies and afford leverage for demanding accountability from teachers. Ultimately, several speakers foresaw technology acting as a catalyst to radically transform the nature of the school—which, said one, "will not be recognized in its current form within a few years."

The research and development required for a range of sophisticated courseware may require more extensive government support than is now being supplied. For example, Teri Perl of The Learning Company in Menlo Park, California, said her group was working on a school math course with aid from the National Science Foundation. Then private venture capital took over the project, and the capitalists decided the home market was more inviting. According to the Educational Products Information Exchange, 80 percent of educational programs have gone on the market with little or no research or testing.

At present, as Dirr noted, the capacity of computers "way outstrips" both the knowledge of how to use them as well as the available software. And their potential significance is beyond the scope of present comprehension. "After 30 years we are only beginning to understand the impact of TV."—**CONSTANCE HOLDEN**